REMARKS

Status of the Claims.

Claims 1, 2, 4-9, 13-16, 20, and 22-32 are pending with entry of this amendment, claims 3, 10-12, 17-19, 21, and 33-98 being cancelled and no claims being added herein. Claims 1, 13, 14, 16, and 23 are amended herein. These amendments introduce no new matter. Support is replete throughout the specification (*e.g.,* in the claims as originally filed, in paragraph 0108 at page 21, in paragraph 0101 at page 20, *etc.*).

Election/Restriction.

Pursuant to a restriction requirement made final, Applicants cancel claims 3, 17-19, 21, and 33-98 with entry of this amendment. Please note, however, that Applicants reserve the right to file subsequent applications claiming the canceled subject matter and the claim cancellations should not be construed as abandonment or agreement with the Examiner's position in the Office Action.

35 U.S.C. §112, First Paragraph.

Claim 1 was rejected under 35 U.S.C. §112, first paragraph, because of a "scope of enablement issue". In particular, the Examiner alleged that the terms "organic molecule", "solvent" and "high-boiling solvent" are too broad. Applicants traverse by amendment.

Per the Examiner's recommendation, Applicants have recited the features of claims 10 and 12 in claim 1, thereby obviating this rejection.

35 U.S.C. §112, Second Paragraph.

Claim 1.

Claim 1 was rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite because of the term "rapidly removed". Claim 1 is amended to simply recite "removed" thereby obviating this rejection.

Claim 16.

Claim 16 was rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite because of the term "protective coating". Claim 16 has been amended herein to recite "masking material" rather than "protective coating. Examiner is reminded that:

> [A] claim is definite if "... read in light of the specification [it] reasonably apprise[s] those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits. *Hybritech Inc. v Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81 (Fed. Cir. 1986) cert. denied 480 U.S. 947 (1987).

In the instant case, the use of photolithographic masking materials is well known to those of skill in the art. As stated in the specification:

> [**0108**] The most common approach involves masking the areas of the surface that are to be free of the organic molecules so that the "coupling" solution cannot come in contact with those areas. This is readily accomplished by coating the substrate with **a masking material (*e.g.* a polymer resist) and selectively etching the resist off of areas that are to be coupled**. Alternatively a **photoactivatible resist** can be applied to the surface and selectively activated (*e.g.* via UV light) in areas that are to be protected. Such "photolithographic" methods are well known in the semiconductor industry (*see e.g.*, Van Zant (2000) *Microchip Fabrication: A Practical Guide to Semiconductor Processing*; Nishi and Doering (2000) *Handbook of Semiconductor Manufacturing Technology*; Xiao (2000) *Introduction to Semiconductor Manufacturing Technology;* Campbell (1996) *The Science and Engineering of Microelectronic Fabrication (Oxford Series in Electrical Engineering)*, Oxford University Press, and the like). [emphasis added] (paragraph 0108 at page 21)

The claims, when read in light of the specification, thus reasonably apprise[s] those skilled in the art both of the utilization and scope of the invention. Moreover recitation of any particular resist would deny the Applicants reasonable inventive scope. Accordingly, the language is as precise as the subject matter permits and the rejection of claim 16 under 35 U.S.C. §112, second paragraph, should be withdrawn.

Claim 23.

Claim 23 was rejected under 35 U.S.C. §112, second paragraph, as indefinite, because the term "high-boiling" was allegedly unclear. Claim 23 is amended herein to recite ". . . a solvent with a boiling point greater than 130°C", thereby obviating this rejection.

Claims 31 and 32.

Claims 31 and 32 were rejected under 35 U.S.C. §112, second paragraph, as indefinite. According to the Examiner, "[i]t is not know that 'free radical initiators' by themselves would halogenate compounds. Applicants traverse. The Examiner is reminded that claims 31 and 32 recite a method where ". . . said halogenating **comprises** contacting said surface with a free radical initiator. The term "**comprises**" is **open claim language** indicating that the recited step can include elements in addition to those recited, but that the recited element must be present. There is no requirement that the claim language expressly recite additional features, nor is the claim read as necessarily requiring that "free radical initiators" by themselves would halogenate compounds. Accordingly, the rejection of claims 31 and 32 under 35 U.S.C. §112, second paragraph, is improper and should be withdrawn.

35 U.S.C. §102.

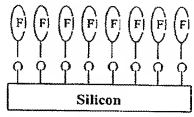
Claims 1-2, and 11-13 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by Marks *et al.* (US 5,834,100). In particular, the Examiner alleges that the claimed method is anticipated by Figure 5A, sheet 3 of 6, by Example 7b, and by col. 7, lines 1-17, and the like. Applicants traverse.

The Examiner is respectfully reminded that in order to make a prima facie case of anticipation, all limitations of the claims must be found in the cited reference or "fully met by it". *Kalman v Kimberly-Clark Corp.*, 218 USPQ 781, 789 (Fed. Cir. 1983). In the instant case claim 1 recites numerous features that are not taught or disclosed by Marks *et al.*

Claim 1, as amended herein recites:

> 1. A method of coupling a **redox-active molecule** to **a surface comprising a Group IV element**, said method comprising:
>
> **halogenating said group IV element surface**;
>
> providing a solution comprising said redox-active molecule wherein said redox-active molecule is selected from the group consisting of a **porphyrin, an expanded porphyrin, a contracted porphyrin, a ferrocene, a linear porphyrin polymer, a porphyrinic sandwich coordination complex, and a porphyrin array**, said redox-active molecule is alcohol terminated, and said alcohol-terminated redox-active molecule is in a solvent; and
>
> contacting said solution with said surface under conditions where said solvent is removed from said surface whereby said redox-active **molecule is coupled to said surface through an E-O bond** where E is said group IV element.

Claim 1 is thus directed to a method of coupling a **redox-active molecule** to a surface comprising a Group IV element where the coupling is through an E-O bond (**where E is the Group IV element comprising the surface**). This is illustrated in Figure 2 of the present application:



As recognized by the Examiner, Marks *et al.* fails to disclose the use of a "redox-active molecule" (see Office Action, page 7, lines 1-5).

Marks *et al.* also fails to disclose a coupling to a surface comprising a Group IV material where the coupling is of the form:

Surface—O—

To the contrary, Marks *et al.* teach the fabrication of light-emitting devices using hydroxylated surfaces that are coupled to silane moieties which, in turn are coupled to various "conducting" layers. Thus, for example, the reaction scheme shown in Figure 5A, cited by the Examiner, shows an indium tin oxide (ITO) surface, not a surface comprising a Group IV material, which is reacted with a "silicon/silane moiety" that is hydrolyzed to provide an Si-OH functionality reactive toward a silicon/silane moiety of another component." As can be seen in Figures 5A and 5B, **the Group IV element does not comprise the surface as recited in the presently pending claims**, but rather forms a component of a silane linker.

Marks *et al.* thus fails to provide all the limitations of the presently pending claims and the rejection under 35 U.S.C. §102(b) should be withdrawn.

35 U.S.C. §103(a).

Claims 1-2, 8-15, and 20 were rejected under 35 U.S.C. §103(a) as allegedly obvious in light of Marks *et al.* (US 5,834,100) in view of Lindsey (US 6,212,093 B1). The Examiner alleged that marks does not teach contacting in the presence of a base, nor that the organic molecule is redox-active, nor that the molecule is a porphyrin, *etc.*, and cited Lindsey as allegedly teaching these features. Applicants traverse.

In the instant case, Marks *et al.* expressly **teaches away** from the presently claimed method. The methods disclosed by Marks *et al.* require the use of a **hydroxyl functionalized surface**, which is then coupled to silicon or silane. In effect, the Group IV element comprises a component of the linker in the Marks *et al.* devices.

Thus, for example, as shown in Figure 5A, the Marks *et al.* method utilizes an indium tin oxide (ITO) surface which is not a Group IV element. This is reacted with a silane to provide a linkage to a subsequently attached Hole Transport Layer (HTL) and Electron Transport Layer (ETL). As shown in Example 7b, cited by the Examiner, ITO-coated slides are coated with 3-aminoproplymethoxysilane, which is then reacted with tosylated aramine [7] or [8] (*see, e.g.,* col. 15, lines 25-35).

Marks *et al.* thus teaches functionalization of a surface that is not the surface of a Group IV material by application of a silane. Marks *et al.* thus teaches away from the presently claimed method in which the surface of a Group IV material is functionalized by halogenation.

Lindsey is only cited as allegedly teaching the use of redox-active moieties and the base N,N-diisopropylethylamine, and accordingly, does not remedy the teaching away provided by Marks *et al.*. Accordingly the combination of Marks *et al.* and Lindsey fails to teach or suggest the presently claimed method and the rejection under 35 U.S.C. §103(a) should be withdrawn.

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. Should the Examiner seek to maintain the rejections, Applicants request a telephone interview with the Examiner and the Examiner's supervisor.

If a telephone conference would expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (510) 267-4161.

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Respectfully submitted,

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